

XXV. THE INSECT FAUNA OF TIRHUT.

I.—RHYNCHOTA HETEROPTERA.

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INTRODUCTION.

In another place (*Indian Insect Life*) I have discussed the general difference there is between the insect fauna of tropical India, and that of the sub-tropical moist hill slopes. I have also indicated the faunal zones of India as I believe they occur with regard to insects. In this memoir, a beginning is being made to elaborate these subjects, first by enumerating the insect fauna of a place lying well within the tropical area, secondly by contrasting that fauna, as far as may be, with neighbouring tropical areas and by discussing its origin. As is abundantly clear from a perusal of the localities in the "Fauna of India," nearly all the species are from sub-tropical or temperate places, very few from tropical India. The localities in the "Fauna" volumes do not, except in such as have been published so recently as to include our collections, enable us to contrast the tropical and sub-tropical faunæ; but the enumeration of the fauna of one spot, very carefully worked for a series of years, will afford some data.

The regional faunæ of India are, except in Lepidoptera, very little known; a compiled list of the fauna of one place (with other records of occurrence in tropical localities) will therefore be of permanent value; we have the material for all orders; we hope to do the Aculeate Hymenoptera, Coleoptera, Lepidoptera and Rhynchota Homoptera; we also hope to do the remaining orders, when we have secured the co-operation of systematists in working out our collections.

In this memoir, I enumerate the Heteropterous fauna of Pusa, following the order of the volumes on Rhynchota, by W. L. Distant, in the "Fauna of India"; I give other localities from which specimens have been collected and are in the Pusa collections, giving dates of capture where possible. I have included species found at Chapra by Mr. M. Mackenzie where we have not found them, as Chapra lies in the same area. Pusa lies in the "Gangetic Plain, West," north of the Ganges, in the Tirhut division of Bengal; it is at a distance of over 50 miles from the Himalayas, and so is well removed from any sub-tropical area; it lies nearly 40 miles north of the Ganges, and is in a flat, densely cultivated tract which should have a uniform fauna (see *Indian Insect Life*, page 25).

PENTATOMIDÆ.

PLATASPIDINÆ.

1. *Brachyplatys pauper*, Voll.

Pusa. 3-viii-05—11-viii-05—23-vii-05.

Podanur, Madras. 30-vii-07.

Khasi Hills. iv-07.

The Fauna gives Ceylon, Andamans, and the Malay Archipelago. It is clearly not a sub-tropical species, but a well-marked tropical one probably.

2. *Brachyplatys subaëneus*, Westw.

Pusa. 2-viii-05—26-vi-07—vii-08.

The Fauna gives this a wide distribution; it is known, for instance, from Mungphu and Calcutta, though not from any other place in the Himalayas. It would probably be a Malayan or Indo-Chinese species, penetrated up through Bengal and essentially tropical.

3. *Coptosoma cribrarium*, Fabr.

Pusa. 14-v-05—23-vi-07—vii-06.

Surat. 15-xii-03.

Muzaffarpur. 19-xi-04.

Ranchi. xi-06.

Nadiad. 6-xii-03.

Mahim. 22-ii-04.

Jalalpur. 7-v-04.

Jullundur. 19-vii-05.

The Fauna gives Calcutta, Bombay, Barwai, Burhanpur, Bangalore, Nilgiris, Nagas, Burma, China, Formosa.

In India, a very common tropical species, clearly not originating in sub-tropical India. Its season for activity and breeding is July to October as a rule, but the imago lives over and is captured at all times.

4. *Coptosoma siamicum*, Wlk.

Pusa. 16-vi-05—22-vii-05—2-viii-05—23-xi-04—1-xii-06—2-ix-07, etc.

Dacca. 13-i-06.

Bombay. x-05.

Raniganj. iii-06.

Surat. 10-vi-04.

The Fauna gives Calcutta, Barwai, Ceylon, Burma, etc. It is apparently a tropical species originating in Malaya or Weddaland.

5. *Coptosoma indicum*, Leth.

Pusa. 19-ix-06.

Palamau. ix-06.

So small as to escape notice. The Fauna gives Ceylon and Siam.

If the species of the sub-family occurring in Sikhim or the Western Himalayas are listed, it will be seen that there are ten species, not known from Pusa, occurring there.

SCUTELLERINÆ.

6. *Cantao ocellatus*, Thunb.

Pusa. 13-xi-05—8-vii-07—13-xi-05—5-vi-07.

Rangpur. 23-vii-05.

Nilgiris. 7,000 feet. 2-v-04.

Khasis. 4,000 feet. v-05.

Not a common species in the plains; essentially a tree insect.

The Fauna gives tropical and sub-tropical localities, and it occurs more abundantly in the latter, where its food is more plentiful.

7. *Scutellera nobilis*, Fabr.

Pusa. 20-iii-07—1-vii-08—24-vii-06—31-vii-05—6-viii-08.

Gojra (Punjab). 11-vii-06.

The Fauna localities are essentially tropical also.

8. *Chrysocoris stollii*, Wolff.

Pusa. 8-vi-05.

Tribeni. 23-iii-05.

Buxar Duars. v-07.

Matheran. iv-08.

Chindwara. 21-iv-08.

The Fauna localities are tropical and sub-tropical, and the species has probably spread up from Malaya.

9. *Chrysocoris patricius*, Wlk.

Pusa. xii-04.

Chapra. x-04.

Cawnpore. 14-x-05.

Dehra Dun. ix-06.

Raipur, C. P. vi-07.

A small species found on rice.

The Fauna gives Ceylon, Manipur, Khasis and Burma. A tropical species.

10. *Hotea curculionoides*, Herr.-Schäff.

Pusa. 3-xii-04—8-vi-05—17-i-05—22-i-05.

Nongpoh, Khasis. 2,000 feet. vii-07.

A rare species found singly on the surface of the soil, etc.

Given in the Fauna as Khasis and Nagas, Burma, Ceylon, Malay Peninsula, etc. Derived probably from Malaya.

11. *Arctocoris incisus*, Stål.

Pusa. 26-vi-08.

A very rare species, that occurs apparently just as an example of how little we *really* do know of our fauna.

The Fauna gives "Bengal," probably North-West India or Himalayas.

There are thirteen species, occurring in the Himalayas nearest to Pusa not found in Pusa and, as before, the species found occur more in Malaya than elsewhere.

GRAPHOSOMATINÆ.

12. *Podops coarctata*, Fabr.

Pusa. 6-i-05.

Salem, Madras. 14-viii-07.

Baroma, Kamrup. 2-iii-07.

Helem, Assam.

A widely spread tropical species, the Fauna giving Tranquebar, Ceylon, Burma, Malay Peninsula and Java.

13. *Podops dentata*, Dist.

Pusa. vi-07.

The Fauna gives only Calcutta and Malda.

14. *Podops limosa*, Wlk.

Pusa. vi-07.

The Fauna gives Calcutta, Tenasserim.

15. *Stortheccoris nigriceps*, Horv.

Pusa. 17-ii-05—8-vi-08—vii-08—7-iii-08.

Comes freely to light in June, July; is found abundantly in soil during January and February.

The Fauna gives only Khasi Hills and Sibsagar.

16. *Amauropepla denticulata*, Hagl.

Pusa. 6 to 13-ii-05. Found in soil.

Elsewhere known only from Assam and Burma.

17. *Melanophara spinifera*, Westw.

Pusa. 3-ii-05.

Like the others, found in soil in the cold weather.

The Fauna gives Bengal, Calcutta and Penang.

This sub-family is not well represented in the Himalayas, *Podops serrata*, Voll., being the only species in Sikhim; it is not in our fauna, which is essentially tropical and originate in Burma or Malaya.

CYDNINÆ.

18. *Stibaropus molginus*, Schiödte.

Pusa. 5-vii-07.

Mokameh. x-06.

This species is extremely abundant at the Ganges, for instance on the Mokameh ferry steamer at night at the arc lights.

The Fauna only records North India and Burma.

19. *Stibaropus callidus*, Schiödte.

Pusa. 15-vi-09—15-vii-07.

Sitamarhi. 15-i-05.

Muzaffarpur. 1-x-04.

Is found in soil in winter. Is sometimes extremely abundant, after rain, at light. Nymphs are found deep in the soil.

The Fauna records Serampore, Calcutta, South India, Burma.

20. *Stibaropus minor*, Wlk.

Pusa. 15-vi-09.

Mokameh. x-06.

Chapra (Mackenzie).

Recorded in the Fauna from North India and Burma.

21. *Lactistes rastellus*, Schiödte.

Pusa. vii-07.

Rampur Boalia. 28-ii-07.

The Fauna records it from Serampore, Burma, Tenasserim, Philippines.

22. *Cydnus indicus*, Westw.

Pusa.—Abundant from June to September, after rain, at light. Found in concealment in soil, fallen leaves, etc., all the winter.

Surat. 20-i-04—September, abundant.

Somastipur. 16-i-05.

Janakpur. 10-i-05.

Raniganj. iii-06.

Kasauli. 6-ii-08.

Shoranur. 31-vii-07.

The Fauna gives Bombay, Burma,—also South Africa, Madagascar, Malay Archipelago, Australia. This is the notorious "Gundy" of India, which comes to light in such immense and irritating profusion. All the records, except Kasauli, are of tropical localities.

23. *Cydnus nigritus*, Fabr.

Pusa. 12-vi-06—1-vii-08.

Cuttack. vi-05.

Jorhat. vi-07.

The Fauna gives Burma, Eastern Europe, Cochin China, China and Japan.

24. *Cydnus varians*, Fabr.

Pusa. 8-vi-07—13-vii-06—6-ii-06.

The Fauna records Bengal, Bombay, Ceylon, Burma, Tenasserim.

25. *Macroscytus subaëneus*, Dall.

Pusa. 24-i-06—22-vi-06.

Buxar Duars. v-07.

The Fauna records Bombay, Deccan, Burma, Tenasserim, the Malay Archipelago, Japan.

26. *Geotomus pygmæus*, Dall.

Pusa.—Abundant in July, August, September. 25-ii-08—v-08.

Palamau. ix-06.

Muzaffarpur. 18-x-04.

Surat. 2-x-04.

The Fauna records Bombay, Ceylon, Burma, Malay Archipelago, China, Japan, Hawaii, New Caledonia.

27. *Brachypelta aterrima*, Forst.

Pusa.—Found from February to April, in each year, in the ripening crops. Appears to be a cold weather species, active only then.

The Fauna records Hardwar and Bombay; common in the Palæartic Region, abundant in North Africa, Queensland. I should class this with the "cold weather species" of Palæartic origin, which have wandered in and are active only in our cold weather and just after. More of this class follow.

28. *Chilocoris nitidus*, Mayr.

Pusa. 17-vii-08.

The Fauna records Kashmir and Japan.

This sub-family is very little represented in Himalayan sub-tropical localities, so far as the records show. Our fauna is largely Malayan and tropical, with one marked Palæartic immigrant.

PENTATOMINÆ.

29. *Halys dentatus*, Fabr.

Pusa.—All months.

Poona. 12-xi-03.

Cuttack. xi-05.

Palamau. 7-ix-06.

Bombay. 20-iii-05.

Surat. 12-vi-04.

Amraoti. 15-iii-04.

Katni. ii-07.

Ranchi. xi-06.

Dacca. i-06.

The Fauna gives a wide distribution in tropical and sub-tropical India. This insect is found on tree trunks, on or under the bark.

30. *Laprius varicornis*, Dall.

Pusa. 12-vi-08—30-vii-08.

Surat. 8-viii-04.

Katni. ii-07.

Khasis. ?

The Fauna gives Sind, Khasis, Cochin, Calcutta, Bombay.

The species appears to be almost confined to tropical India.

31. *Eliomorpha lineaticollis*, Westw.

Pusa. 3-xi-05—27-vi-06—2-ix-07—2-iv-07.

Bombay. 14-iv-05.

Palamau. ix-06.

Ranchi. xi-06.

Balaghat. iii-07.

Munshiganj. 21-i-06.

The Fauna gives Bengal and Bor Ghat. A tropical species apparently.

32. *Adria parvula*, Dist.

Pusa. vii-08.

Cawnpore. 16-x-05.

Purulia. xi-06.

Surat. 8-vii-04—1-vi-04—1-xii-03—7-viii-04—26-xi-03—24-v-04—5-iii-04.

Palamau. ix-07.

The Fauna records Ranchi, Khandala and Burma. This distribution would point to the tropical areas and the sub-tropical hill areas they enclose (*i.e.*, exclusive of Himalayas, Assam, etc.).

33. *Mecidea indica*, Dall.

Pusa. 27-v-06—26-vi-06.

Lyallpur.

The Fauna gives Bombay and Poona. This insect is fairly conspicuous and if it occurred in the Himalayas would probably have been found.

34. *Enaria elongata*, Dall.

Chapra (Mackenzie).

The Fauna records North India, Burma, Tenasserim, Philippines.

35. *Halyomorpha picus*, Fabr.

Pusa. 11-vi-06.

The Fauna gives a wide distribution, including the Khasis, Calcutta, Burma: "a common species throughout Malaysia and found in China and Japan."

36. *Dolycoris indicus*, Stål.

Pusa.—Very commonly found from February to May. Found sparingly for rest of year.

Palamau. 30-ix-06.

Lahore. 20-iv-07.

The Fauna gives Naga Hills, Darjiling, Bombay, Deccan, Bangalore, Calcutta.

Probably universal in tropical India; it is a species that lives on green herbage and is easily confused with *Agonoscelis nubila*. The closely similar *Dolycoris baccarum*, Linn., does not appear to occur at Pusa.

37. *Æschrocoris tuberculatus*, Stål.

Pusa. 16-x-06—19-viii-08.

The Fauna records Sikhim, Garo and Naga Hills, Burma. A rare species in Pusa.

38. *Eusarcocoris guttiger*, Thunb.

Pusa. 18-iii-05—23-iv-07—19-v-05—9-iv-06—2-vii-06—vii-08—24-xii-04.

Surat. 24-v-04.

Belgaum. iv-08.

Simla. x-06.

Muzaffarpur. 12-x-04.

Dacca. 10-i-06.

Balaghat. iii-07.

Chapra. 20-x-04.

Nasik. 26-ii-04.

The Fauna records Sikhim, Naga Hills, Bombay, Calcutta, Ceylon, Burma, Tenasserim, China, Japan; a widespread species in tropical and sub-tropical India.

39. *Eusarcocoris ventralis*, Westw.

Pusa. 3-iii-05—30-ix-06—x-06—28-xi-04—10-iv-07—8-xi-05—viii-04.

Chapra. 20-x-04.

Muzaffarpur. 15-x-04.

Surat. 19-viii-04—17-i-04.

Khasis. 17-iii-07.

The Fauna includes Calcutta, Bangalore, Ranchi, Bombay, Burma, Malay Peninsula.

This is a tropical species; compare with *E. montivagus*, Dist., the very distinct hill form of the Himalayas, found from Assam hills to Mussoorie.

40. *Eusarcocoris dubius*, Dall.

Pusa. 29-ix-06—12-viii-05—21-ix-08.

The Fauna records Tenasserim and Berhampore (? in Bengal).

I am a little doubtful of the identification but believe all mine to be this tropical species.

41. *Plautia fimbriata*, Fabr.

Pusa. 26-iii-06—27-v-06—14-vi-06—5-vi-07—30-vii-08—4-vii-07.

Surat. 26-i-04.

Arrah. 19-iii-08.

In the Fauna, a wide tropical and sub-tropical distribution in India, and also in Malaya, China and Japan. The Pusa dates imply nothing more than the fact that, like other bugs found on plants, they are commonly caught in those months because all crowd on to the small irrigated crops and are seen, when they are unnoticed later in the more abundant herbage.

42. *Antestia cruciata*, Fabr.

Pusa. 18-iii-06.

Nagpur. 6-vi-05.

Kasauli. 6-v-08.

Matheran. iv-08.

Igatpuri. iii-08.

Nilgiris. vii-05.

The Fauna records Sikhim, Calcutta, Bombay, Nilgiris, Ceylon, Tenasserim, Malay Archipelago.

A species well known to feed on fruit, peaches, plums and coffee-berries; it is an abundant sub-tropical species, but is found sporadically in the plains; possibly the occurrence of fruit orchards or wild fruiting bushes such as bér (*Zizyphus jujuba*) affect its occurrence.

43. *Apines concinna*, Dall.

Pusa. i-v-07—vi-07.

The Fauna gives Hardwar, Bombay. A rare tropical species.

44. *Agonoscelis nubila*, Fabr.

Pusa.—General throughout the year and extremely abundant on all green herbage and plants such as jute, maize, etc. Sometimes sucks forming grain.

Purulia. xi-06.

Jorhat. v-07.

Balaghat. iii-07.

Dacca. 10-i-06.

Munshiganj. 17-1-06.

Sitamarhi. 15-i-05.

Nilgiris. 7,000 feet. v-04.

Chapra. x-04.

The Fauna records it over a wide area from Kashmir to Bombay and Burma, Malay Peninsula, China, Japan; a tropical and sub-tropical species.

45. *Eurydema pulchrum*, Westw.

Pusa. 3-iv-05—12-iv-06—27-iii-06—18-v-06.

Khasis.

In the Fauna, is given as a sub-tropical species. Possibly an immigrant from sub-tropical Himalayas.

46. *Bagrada picta*, Fabr.

Pusa.—In all years, very common on ripening mustard, rape and allied crops in February, March, as on cabbage and similar *Cruciferae*.

The Fauna gives Hardwar, Tirhut, Calcutta, Manipur, Bombay, Ceylon.

It is common in the Konkan, the Deccan, Central Provinces, United Provinces, and a small form is common at Lebong. Essentially a "cold weather species," not possibly from climatic causes so much as that its food plants enable it to breed then.

47. *Placosternum taurus*, Fabr.

Pusa. 1-vii-05.

Mussoorie. viii-06.

Yercaud.

The Fauna records it as a hill species from Sikhim, N. Khasis, Cochin and Burma. It is rare in Pusa and may have been a chance immigrant, as it is a very conspicuous form.

48. *Catacanthus incarnatus*, Dru.

Pusa. 9-vi-05—1-v-08.

Mahim. 22-ii-04.

Khasis.

Poona. 19-vi-05.

Kanara. viii-07.

The Fauna gives it a wide spread in the hills, but also includes Calcutta, Karachi, Bombay, Pondicherry.

It is a Malay Archipelago species, also from Japan and Korea.

It is the most conspicuous tropical form and is, in the plains, rare.

49. *Nezara viridula*, Linn.

Pusa.—In all months.

Surat. 2-iv-04—7-ii-04—18-xii-03.

Coonoor. 17-iv-04.

? Shevaroy. viii-07.

Coimbatore. 27-vii-07.

Bilaspur. ii-07.

Ranchi. x-06.

Purulia. xi-06.

The Fauna records all India, and almost the whole world. A tropical, sub-tropical and temperate species.

50. *Piezodorus rubrofasciatus*, Fabr.

Pusa.—All months.

Bilaspur. ii-07.

Katni. ii-07.

Surat. 18-xii-07—21-i-04.

Bassein. 23-xii-03.

Nadiad. 5-xii-03.

Burdwan. ii-05.

The Fauna records Sikhim, Assam, Bengal, Bor Ghat, Ceylon, Upper Burma, Malaya, Japan, Australia.

A well-established tropical and sub-tropical species, found abundantly on low vegetation.

51. *Menida histrio*, Fabr.

Pusa. 1-ix-04.

Chapra. 30-x-04.

Cuttack. 23-xi-05.

Dacca. 19-i-06.

The Fauna gives Calcutta, Bangalore, Burma, China, Formosa. A tropical species, as opposed to the sub-tropical *M. varipennis*, Westw., and *M. formosa*, Westw.

In this sub-family we have twenty-three species in our fauna, while there are at least forty sub-tropical species known from our nearest sub-tropical area that are not known from Pusa, though we have specimens of most of them in the collection and could recognise them. Our fauna here is essentially tropical.

AMYOTEINÆ (ASOPINÆ).

52. *Cazira verrucosa*, Westw.

Pusa. 19-vi-06.

Khasis. vii-07.

Nilgiris. v-06.

Calcutta is the only tropical locality given in the Fauna. It is a sub-tropical species apparently.

53. *Cazira ulcerata*, Herr.-Schäff.

Pusa. 31-viii-05—21-iv-06.

The Fauna gives Sikhim, Calcutta, Coromandel, Siam and Hong-Kong.

54. *Canthecona furcellata*, Wolff.

Pusa.—All months.

Daltonganj. viii-05.

Lebong. ix-08.

A widespread species, wholly predaceous on caterpillars and breeding when these are abundant.

The Fauna records are tropical mainly. It probably occurs throughout tropical India.

55. *Canthecona parva*, Dist.

Chapra.

Daltonganj. viii-05.

The Fauna records Bengal and Mysore.

56. *Picromerus griseus*, Dall. (*obtusus*, Wlk.).

Pusa. 17-vii-05.

The Fauna records only Sikhim, Nagas, Burma.

57. *Andrallus (Audinectia) spinidens*, Fabr.

Pusa. 22-ii-07—18-iv-07—14-vi-06—23-v-05—vi-07—27-viii-08—13-x-07—1-xi-08.

Lebong. ix-08.

Nagpur.

The Fauna records Sikhim, Assam, Khasis, Ranchi, Bangalore. It is probably common over part of the tropical plains; outside India, it is in the Malay Archipelago, Fiji, Tahiti, etc.

58. *Amyotca (Asopus) malabaricus*, Fabr.

Pusa. 10-x-08.

Nagpur. 24-vi-06.

The Fauna records Bengal, Calcutta, Bombay, Bangalore, Assam, Burma, Java, Borneo, Sumatra and the Philippines.

It is not a common species in Pusa.

59. *Zicrona cærulea*, Linn.

Pusa. 3-iv-05—18-ix-08—17-viii-08.

Mussoorie. viii-07.

Chandpur. i-08.

The Fauna gives Kashmir, Bengal, Naga Hills, Burma, Japan, China, Malaya and the Palearctic Region. Its distribution may be determined by that of its food, *Haltica cyanea*, etc.

In this sub-family, nearly all the species of neighbouring areas are found here, even if only sparsely.

TESSARATOMINÆ.

Of the dozen species found in the Himalayas, not one has been found in Tirhut. The sub-family is markedly sub-tropical, with not one tropical species.

DINIDORINÆ.

60. *Aspongopus janus*, Fabr.

Pusa. 25-i-06—iv-07—31-v-05—22-vi-05—5-vii-05—viii-07—7-x-06.

Sawan. 4-x-06.

Surat. 8-vii-04.

Somastipur. 15-ii-05.

Muzaffarpur. 8-x-04.

Daltonganj. vii-05.

The Fauna records tropical and sub-tropical localities in India, also Ceylon and Burma.

61. *Aspongopus obscurus*, Fabr.

Pusa. 12-vii-07—27-vi-07—20-ii-08—9-ix-07.

Ranchi. xi-06.

Jorhat. v-07.

Daltonganj. viii-05.

Sawan. 4-x-06.

Rungpur.

Siripur. 18-viii-05.

Helem. viii-08.

Khasis. vii-07.

The Fauna records Assam, Bombay, Calcutta and Bangalore. A tropical form.

PHYLLOCEPHALINÆ.

62. *Schizops insignis*, Wlk.

Chapra (Mackenzie).

The Fauna gives Burma only.

63. *Diplorhinus quadricornis*, Stål.

Chapra (Mackenzie).

The Fauna gives Assam and Burma.

64. *Tetroda histeroides*, Fabr.

Pusa. 14-ix-08.

Salem. 14-viii-07.

The Fauna records are Sikhim, Nagas, Burma, Malay Peninsula.

65. *Megarhynchus rostratus*, Fabr.

Pusa. 10-iii-05—vi-05—3-xi-06—25-xi-04—19-xii-05.

Siripur. 18-viii-05.

Comilla. 21-i-06.

Chapra.

The Fauna records Sikhim, Assam, Burma, Malaya, etc.

66. *Megarhynchus truncatus*, Westw.

Pusa. 30-iii-06—iii-07.

The Fauna records Naga Hills, Khasis, Burma, Malaya, etc.

In this sub-family all our species are known also from Burma.

UROSTYLINÆ.

None have been found; there are fifteen species known from the neighbouring Himalayas, but none appear to occur in this tropical area.

ACANTHOSOMATINÆ.

67. *Microdeuterus megacephalus*, Herr.-Schäff.

Pusa. 25-xii-08—28-viii-07.

Belgaum. iv-08.

The Fauna records Bombay, Calcutta, Sikhim, Burma

68. *Microdeuterus dallasi*, Atk.

Pusa. xi-08—26-iv-08—3-v-06—26-iv-06.

Chapra (Mackenzie).

Recorded from North India.

Anaxandra and *Elasmostethus* have been found, but the specimens have been sent for accurate determination.

In this family, the dates of capture are not of much value, since the adult is always to be found; that is, hibernation or similar

seasons of rest are passed in that stage. We have mentioned a few "cold weather species" but such are far less marked than in other orders and this, which is so marked a feature of our tropical fauna, is here inadequately brought out.

The Pentatomidæ are a family which offer valuable data for faunistic purposes, because they have been more collected than any other families. The occurrence of Cydninæ and Graphosomatinae, the absence of Tessaratominae and Urostylinæ, are marked features in comparing a tropical fauna such as this with the nearest sub-tropical one, and this family alone offers good reason for the fundamental distinctions between sub-tropical and tropical fauna which I have suggested in *Indian Insect Life*.

Conclusions.

- (1) The fauna of the Gangetic Plain, West, as a tropical area, consists of a few species, well established and abundant, and some less abundant.
The well-established very abundant ones may be those that have accustomed themselves to dry heat and having less inter-species competition, and a greater amount of food, become abundant. That is, if a species can live at all, it is likely to do very well if its food is one of the common plants or insects, because there are few plants but many of each. That is a characteristic of the tropical zone, whereas in moist sub-tropical areas there is a greater diversity of food plants but less of each; there are in the latter more species, more inter-species competition, a greater diversity of fauna but few really abundant dominant species. One can see that, if one collects in both areas, very markedly.
- (2) There is a greater fauna of species living in soil than there is in a sub-tropical region. Plataspidinæ, Graphosomatinae, Cydninæ are actually largely soil-living, root-feeding forms very largely. They are enormously abundant in this tropical fauna, very scarce in a sub-tropical one.
- (3) A large percentage of the fauna is common also to Assam, Burma, Malay Archipelago.
- (4) The fauna owes little to the neighbouring sub-tropical ones of the Himalayas.
- (5) It contains a small definite number of cold weather species, derived probably from North-West India (the Indus Plain).
- (6) There is no real indigenous fauna; all is derived from areas of older geological formation.
- (7) There is a proportion of well-established species found all over the tropical plains; there is also a proportion probably peculiar to this and the Gangetic Plain, East,

not found for instance in the Deccan, West Coast, or Coromandel Coast.

- (8) A number of species established in the Gangetic Plain, East, are not so established or found in this area, and the division of Gangetic Plain, East and West, dividing somewhere about Purneah, is valid.

COREIDÆ.

COREINÆ.

69. *Elasmonia granulipes*, Westw.

Pusa. vi-08.

Lebong. ix-08—v-09.

A Sikhim species, rare in Pusa.

70. *Anoplocnemis phasiana*, Fabr.

Pusa. 21-ix-06—22-vi-05.

Siripur. 18-viii-05.

Nilgiris. 7,000 feet. v-04.

Igatpuri. 20-vi-04.

The Fauna records a widespread sub-tropical distribution but includes Sibsagar, Bombay and Bangalore. The species is Malayan and Himalayan.

71. *Homæocerus inornatus*, Stål.

Pusa. 10-vi-05—vi-07—vi-06—14-viii-07.

Jullundur. 25-vii-05.

Chapra (Mackenzie).

This species is confined to the sissu tree and breeds on it from June to August. Where it spends the intervening months is not known.

The Fauna gives Sikhim, Pondicherry, Burma, China.

72. *Homæocerus prominulus*, Dall.

Chapra (Mackenzie).

Surat. 16-xi-03—18-xii-03.

The Fauna records North Bengal, Bombay, Ceylon.

73. *Aschistus brevicornis*, Dall.

Pusa. ix-06—22-v-05.

Chapra (Mackenzie).

Bilaspur. iii-07.

The Fauna records North Bengal.

74. *Notobitus melcagris*, Fabr.

Chapra (Mackenzie).

Purulia. xi-06.

Ranchi. xi-06.

Simla. x-07.

The Fauna records Bombay, Khasi Hills, Burma.

75. *Plinactus acicularis*, Fabr.

Muzaffarpur. 16-xi-04.

Matheran. iv-08.

The Fauna gives Bhutan, Bombay, Ceylon.

76. *Cletus bipunctatus*, Westw.

Pusa.—All months.

Surat.—April to August.

Tribeni. 22-iii-05.

Chapra. x-04.

Katni. ii-07.

Palamau. ix-06.

The Fauna gives Bombay, Calcutta, Bangalore, Ceylon, Burma. This is the tropical form, while *C. punctulatus*, Westw., is the sub-tropical one.

77. *Cletus punctiger*, Dall.

Pusa. 14-vi-06—7-vii-06.

The Fauna gives Murree, Calcutta, Pegu, China.

78. *Cletomorpha hastata*, Fabr.

Pusa. 9-viii-05.

Chapra.

Parel. 7-iii-05.

Matheran. iv-08.

The Fauna gives Karachi, Bombay, Calcutta; except for Matheran, a tropical species.

In this sub-family there is a marked absence of the large forms so common in sub-tropical India. If they occurred they would be found, and in quite short periods of collecting in sub-tropical areas we have obtained abundant species not found in Pusa. The difference is very marked and is, we believe, due largely to the scanty tree flora of the plains.

PSEUDOPHLÆINÆ.

79. *Clavigralla gibbosa*, Spin.

Pusa.—Most abundant from January to May when it breeds.

Surat.—December to April, abundant.

Bilaspur. ii-07.

Purulia. xi-06.

Katni. ii-07.

Lebong. ix-08.

Buxar Duars.

The Fauna records Bombay, Bangalore, Tenasserim; a tropical species.

80. *Stenocephalus laterarius*, Sign.

Pusa. 27-v-06.

The Fauna gives Bombay and Madras, Ceylon.

ALYDINÆ.

81. *Leptocorisa varicornis*, Fabr.

Pusa.—Breeds May to November.

See *Memoirs Agricultural Department*, Entom. II, No. 1, for full localities. They include all rice areas, both tropical and sub-tropical localities. Ceylon, Burma, Malaya, China are added by the Fauna.

I cannot recognise *L. acuta*, Thunb., or *L. costalis*, Herr.-Sch., but the latter I believe I recognise in some of Mr. Mackenzie's Chapra specimens. I do not include it as a distinct species.

82. *Riptortus pedestris*, Fabr.

Pusa. 24-viii-06—25-ix-07—xii-08—24-x-05.

Lebong. ix-08.

Manickganj. 28-x-06.

The Fauna gives Bombay, Bangalore, Ceylon, Khasis, Burma, etc.; except for Lebong it might be a clear tropical species.

83. *Riptortus fuscus*, Fabr.

Pusa. 20-iii-05—25-ix-05—20-iii-05.

Cuttack. x-05.

Lebong. vi-09.

Manickganj. 25-x-06.

The Fauna gives Bengal, Bombay, Bangalore, Ceylon, Burma, Malaya.

84. *Riptortus linearis*, Fabr.

Pusa.—All months.

Balaghat. iii-07.

Cuttack. xi-05.

Comilla. 22-i-05.

Munshiganj. 21-i-06.

Manickganj. 29-x-06.

The Fauna records such sub-tropical spots as Sikhim, Bor Ghat, etc.; also Bangalore, Ceylon, Burma, Malaya, etc.

The species is the common one in Pusa, breeding freely when it can feed on leguminous pods.

85. *Akbaratus fischeri*, Dist.

Pusa. 24-vii-08.

Surat. 16-viii-04.

Chapra.

An insufficiently known species.

CORIZINÆ.

86. *Corizus rubicundus*, Sign.

Pusa. 20-xii-07—vi-07—iii-07.

Surat. vi-04—8-xii-04.

Recorded from Ceylon.

87. *Corizus bengalensis*, Dall.

Pusa. 10-vii-07—xi-07—9-iv-06—21-v-06—10-i-07—8-xii-05.

Surat. 19-ii-04.

Mussoorie. x-06.

Chiniot. 8-vii-07.

Jullundur. 12-vii-06.

Buxar Duars. v-07.

The Fauna gives North Bengal and the Bor Ghat.

I confess to doubt as to these being distinct and I lay no stress on their occurrence. In view of the remarkable colour changes of this insect at the last moult, I cannot believe they are distinct. I have however followed Distant, who presumably has clearly distinct series.

The insect is abundant at Pusa.

88. *Serinetha abdominalis*, Fabr.

Pusa. vi-07.

Kanara. viii-07.

Bankura. iii-07.

Burdwan. iii-06.

Tribeni. 23-iii-05.

The Fauna records Bombay, Calcutta, Assam, Ceylon, Tenasserim.

S. augur, Fabr., we have not found.

This family offers little but the marked paucity of large forms already commented on. Its members here are largely Burmese or Malayan, and our fauna owes little to neighbouring sub-tropical areas; rather our species may be those of the Gangetic Plain, East, able to stand the greater dryness and heat of our area and migrated in from the East.

BERYTIDÆ.

89. *Metacanthus pulchellus*, Dall.

Pusa. vi-06—iv-07.

LYGÆIDÆ.

LYGÆINÆ.

90. *Lygæus militaris*, Fabr.

Pusa.—In all months.

Igatpuri. 20-vi-04.

Bilaspur. ii-07.

Bankura. iii-05.

Surat. 27-v-04.

Lyallpur. 10-vii-06.

Purulia. xi-06.

Madras. 12-x-07.

The Fauna gives localities in tropical India, from Murree to Mysore, also Burma, Malay Archipelago.

A very common tropical species.

91. *Lygæus hospes*, Fabr.

Pusa.—In all months.

Surat. 6-v-04.

Muzaffarpur. 12-x-04.

Bankura. iii-06.

Palamau. ix-06.

Lyallpur. 10-vii-06.

The Fauna records Sind, Bombay, Madras, Bangalore, Nilgiris, Ceylon, Burma, Malay, etc.; Sind is a notable locality, as few of our species above have been recorded from further north-west than the north-western limits of this sub-province.

92. *Lygæus fimbriatus*, Dall.

Pusa. 26-viii-08.

Recorded in the Fauna from Assam and Burma. A rare species here.

93. *Graptostethus servus*, Fabr.

Pusa.—All months.

Surat. 6-v-04.

Chapra. 22-x-04.

Bilaspur. ii-07.

Another Malayan species, recorded in the Fauna from Assam, Bombay, Calcutta, Nilgiris, etc., as well as Ceylon and Burma.

94. *Graptostethus trisignatus*, Dist.

Pusa. 26-iii-05.

Jorhat.

The Fauna gives Naga and North Khasi Hills, and Burma.

95. *Graptostethus maculatus*, Dall.

Pusa. 28-ix-05—2-ii-05—13-iii-05.

The Fauna records North India and Narkanda.

96. *Aspilocoryphus guttiger*, Dall.

Pusa. 19-v-06—13-iii-06.

North Bengal is the only record.

97. *Nysius minor*, Dist.

Pusa.—Common at all times.

This is a species described since the Fauna volume. I am not prepared to recognise any other species in Pusa though Mr. Distant might and Mr. Kirkaldy presumably would find several. I believe that food plants and perhaps climate influence this species like all others, and I am extremely surprised a new species should be made of our form. My own feeling is that long series from different places and collected at different times will, in this genus, reduce the now existing six Indian species to fewer. *Nysius*, as a genus, is distinct enough; its species are not, but the genus is widespread in India, both in the plains and to such elevations as 7,000 feet as at Simla. I have omitted all records except Pusa as I cannot satisfactorily place our other forms among the six described species.

If any sub-family should give us data, it is this, as its members are those most likely to have been collected; we have not found *Graptostethus argentatus*, Fabr., nor *G. dixonii*, Dist., though we have the latter from several places in Central India, East. Several North Indian species, such as *Cænocoris*, are not found and our fauna appears to be from Assam or Burma, as in the previous families.

CYMINÆ.

98. *Cymus tabidus*, Stål.

Pusa. 19-vii-08.

Recorded from Bengal. Mr. Distant has seen our specimens. It is an inconspicuous insect, probably not confined to Bengal.

BLISSINÆ.

99. *Macropes punctatus*, Wlk.

Muzaffarpur. 17-x-04.

Recorded from North India.

100. *Macropes excavatus*, Dist.

Pusa.—All months.

Recorded from Shillong.

We have a very long series from Pusa, which may or may not be one species. Allowing for newly transformed individuals, which are brown, for the varying shrinkage of the abdomen according to the chitin being less or more hardened with the duration of time from the last ecdysis, and for variation, it is very hard to place a long series in any one species. At all events most of ours agree with this species but others, e.g., *M. dilutus*, may also occur.

101. *Blissus gibbus*, Fabr.

Pusa. 29-xii-04—18-i-05—13-vi-05.

Belgaum. iv-08.

The Fauna gives Bor Ghat and Cawnpore. A retiring root-feeding species, seldom seen but probably widespread.

GEOCORINÆ.

102. *Geocoris tricolor*, Fabr.

Pusa.—All months.

Surat. 7-iv-04—9-vii-04.

Lebong. ix-08.

Chapra. 22-x-04.

The Fauna gives Calcutta, Bangalore, Bor Ghat, Ceylon, Burma. This is equivalent to its being widespread over tropical India.

COLOBATHRISTINÆ.

103. *Artemidorus pressus*, Dist.

Pusa. 30-v-06—26-i-04.

Matheran. iv-08.

The Fauna gives Calcutta, Ceylon, Burma.

HETEROGASTRINÆ.

104. *Epibomius pusa*, Dist.

Pusa.—Date removed in transit.

A new species, apparently rare.

105. *Dinomachus rhacinus*, Dist.

Pusa. 12-vii-06—26-iv-06—21-ix-08.

An abundant species on tree trunks, described since the Fauna.

PACHYGRONTHINÆ.

None found.

OXYCARENINÆ.

106. *Oxycarenius lætus*, Kby.

The species abundant wherever cotton is, from Tinnevely to the north-west. Its scanty record in the Fauna shows how little Lygæids have been collected.

107. *Oxycarenius lugubris*, Motsch.

Pusa. 13-vi-05.

Recorded from Ceylon only.

APHANINÆ.

108. *Paromius seychellesus*, Wlk.

Pusa. 3-viii-05.

Palamau.

Manickganj. 24-x-06.

Barisal. 8-vi-06.

Recorded from Ceylon, Burma, etc.

109. *Paromius exiguus*, Dist.

Pusa. 22-iii-06.

Recorded from Ceylon and Japan. Mr. Distant identified our specimens.

110. *Pamera pallicornis*, Dall.

Pusa. 31-viii-04—25-vi-06—6-x-06—5-vii-07—4-ix-07.

Chapra.

Lebong. ix-08.

The Fauna gives Shillong, Kurseong, Ceylon, Burma, etc.

111. *Pamera vincta*, Say.

Pusa. 27-vi-06—30-x-06—26-vi-07.

Manickganj. 26-x-06.

The Fauna gives Ranchi, Calcutta, Ceylon, Burma. It is a grass and soil species, probably widely spread in India, but not noticed.

112. *Appolonius cincticornis*, Wlk.

Pusa. 3-v-06.

Recorded from Ceylon.

113. *Lachnophorus cingalensis*, Dohrn.

Chapra (Mackenzie).

Nagpur. 21-i-06.

Recorded from Bor Ghat, Bombay and Ceylon.

114. *Adauctus cupreus*, Dist.

Pusa.—Date lost in transit.

A new species.

115. *Aphanus sordidus*, Fab.

Pusa. 14-xi-04—4-iii-05—17-vii-07.

Belgaum. iv-08.

Ranchi. xi-06.

The Fauna records Assam, Bengal, Bombay, Ceylon, Burma, etc.

116. *Aphanus bengalensis*, Dist.

Pusa. 1-vii-07.

Chapra.

A new species.

117. *Dieuches uniguttatus*, Thunb.

Pusa.—All months.

Dacca. 10-i-08.

Belgaum. iv-08.

Recorded by the Fauna from Assam, Bangalore, Ceylon, Andamans, Burma, etc.

A very common species here.

118. *Dieuches leucoceras*, Wlk.

Chapra (Mackenzie).

Mussoorie. viii-07.

Buxar Duars. iv-08.

Kangra (Dudgeon).

Lebong. ix-08.

Recorded from Kashmir, Bor Ghat, Bombay, Ceylon and Bushire (Persia).

119. *Pæantius festivus*, Dist.

Pusa. 2-iii-05—29-xii-07—26-vi-07.

Recorded in the Fauna from Ceylon and Calcutta.

120. *Abanus coloratus*, Dist.

Chapra (Mackenzie).

A new species.

121. *Lethæus indicus*, Dall.

Pusa. vi-07—9-xii-05.

The Fauna gives North Bengal and Burma.

122. *Gonsalvus typus*, Dist.

Pusa. 8-iv-07.

Recorded by the Fauna from Mandalay.

With regard to the Lygæidæ as a whole not much can be said. There is a predominance of forms found also in Assam, Burma and Malaya, few of which extend either to the nearest sub-tropical area or to the tropical regions in the north-west. The palæarctic forms which have migrated from Sind into North India have not reached the Western Gangetic Plain. Unfortunately the Lygæidæ are little collected; they are small, not easy to identify, uninteresting as "specimens," and very little known. Many more of the obscurer forms of Pusa remain to be found and described probably, and a number are with Mr. Distant or are awaiting description. Such forms, however, being new, offer no data with regard to faunal zones.

PYRRHOCORIDÆ.

LARGINÆ.

123. *Iphita limbata*, Stål.

Pusa. 28-iii-05—23-iv-07—25-vii-05—6-ix-07—16-xi-04—25-xii-05.

Dacca. 15-i-06.

The Fauna records Assam, Hardwar, Calcutta, Tenasserim.

124. *Physopelta gutta*, Burm.

Pusa. 9-xii-05.

Lebong. ix-08.

Helem.

The Fauna records Assam, Ceylon, Burma, etc.

125. *Physopelta schlanbuschi*, Fabr.

Pusa. 23-xii-05—20-viii-07—3-ii-06.

The Fauna records Assam, Burma, etc.

In this sub-family, the only notable thing is the complete absence in Tirhut of *Lohita grandis* which has, apparently, not got beyond the limits of the Gangetic Plain, East. Our three Larginæ are all common to Assam and Burma.

PYRRHOCORINÆ.

126. *Antilochus coqueberti*, Fabr.

Pusa.—All months.

Helem.

Bor Ghat. 13-iii-03.

Baroma. 2-iii-07.

Jammoo. 11-iv-08.

Buxar Duars.

Cuttack. xi-05.

The Fauna records Kashmir, Assam, Calcutta, Secunderabad, Ceylon, Burma, etc.

127. *Euscopus indecorus*, Wlk.

Pusa. 6-xii-05.

Recorded from Assam, Ceylon, Burma, Siam.

128. *Dermatinus lugubris*, Dist.

Pusa. 17-vii-05.

Nilgiris. 10-iv-06.

Igatpuri. 20-vi-04.

Bilaspur. ii-07.

Recorded only from Pondicherry.

129. *Scantius pallens*, Dist.

Pusa. 6-vii-07—2-vi-08.

Katni. ii-07.

Nagpur. 5-iii-05.

Hafizabad. 21-vii-06.

Recorded from Sind.

130. *Scantius volucris*, Gerst.

Pusa. 11-vii-05.

Bulsar. 21-v-04.

Bilaspur. ii-07.

Lahore. 19-iv-08—7-ix-04.

Recorded from Madras, Coonoor, British East Africa.

131. *Dysdercus cingulatus*, Fabr.

Throughout the cotton-growing areas of India, and practically throughout the tropical area. In sub-tropical localities such as Sikhim up to 5,000 feet.

Recorded from Burma, Ceylon, Malaya, etc.

132. *Dysdercus evanescens*, Dist.

Pusa. 4-iv-07—10-viii-08.

Chapra.

Bor Ghat. 14-iii-01.

Buxar Duars. v-07.

Recorded from Sikhim, Assam, Bor Ghat and Burma.

Our fauna is a small one, not containing many species, *e.g.*, *Dindymus*, *Odontopus*, etc., of Assam, and without immigrants from the North-west such as *Pyrrhocoris* that one might expect.

TINGIDIDÆ.

133. *Cantacader uniformis*, Dist.

Pusa. 6-iii-05.

Recorded from North Bengal and Burma.

134. *Serenthia gibba*, Fieb.

Pusa. 25-ix-06.

Recorded from "East India."

135. *Paracopium cingalense*, Wlk.

Bhagalpur. iii-09. (E. J. Woodhouse.)

The Fauna records Ceylon. Bhagalpur is in our area, doubtfully.

136. *Galeatus darthula*, Kirk.

Pusa. x-08.

Recorded from Ceylon.

137. *Celantia vagans*, Dist.

Pusa. 15-iv-08.

Recorded from Ceylon.

138. *Compseuta lefroyi*, Dist.

Pusa.—Date lost in transit.

A new species.

139. *Monanthia globulifera*, Walk.

Pusa.—All months.

Recorded from Ceylon and Madras.

140. *Belenus bengalensis*, Dist.

Pusa. 10-viii-08—20-xi-08.

Muzaffarpur. 10-x-04.

Records of Tingididæ are so scanty, there is nothing to say of our species. Many remain to be found here, and collecting is badly needed everywhere in the plains. The family is quite as much tropical as sub-tropical.

PHYMATIDÆ.

Of the nine Indian species, we have none from the plains at all. The family appears to be essentially sub-tropical, though nowhere abundant.

ARADIDÆ.

No species known from our Fauna. They are not uncommon in sub-tropical India.

HEBRIDÆ.

None known.

HYDROMETRIDÆ.

MESOVELIINÆ.

141. *Mesovelgia mulsanti*, Buch. Wh.

Pusa. 2-i-07.

Recorded from Ceylon, Sumatra, etc.

HYDROMETRINÆ.

142. *Hydrometra vittata*, Stål.

Pusa.—All months.

Muzaffarpur. 13-i-05.

Jalalpur. 24-v-04.

Recorded in the Fauna from Bombay, Bor Ghat, Ceylon, Burma, Malaya, etc.

VELIINÆ.

143. *Microvelgia repentina*, Dist.

Pusa. 16-i-07.

Recorded from Calcutta.

144. *Microvelgia singalensis*, Kirk.

Pusa. 16-i-07, etc.

Recorded from Ceylon. It is common on stagnant water with the last species.

GERRINÆ.

145. *Gerris nitida*, Mayr.

Pusa. 21-xii-04—9-i-05.

Recorded from Trivandrum, Ceylon and Burma.

146. *Gerris tristan*, Kirk.

Pusa. 24-xii-04.

Recorded from Ceylon.

147. *Gerris spinolæ*, Leth. et Sev.

Pusa. 24-xii-04.

The Fauna records North India, Calcutta, Ceylon, Burma, China.

HENICOCEPHALIDÆ.

148. *Henicocephalus basalis*, Westw.

Pusa.

Chapra.

Cuttack.

The Fauna gives Bengal, Bombay, Bor Ghat, Coromandel, Burma.

A widespread, retiring, tropical insect.

REDUVIDÆ.

HOLOPTILINÆ.

We have none of the four likely species.

EMESINÆ.

We have three species, apparently new to the Fauna.

SAICINÆ.

Polytoxus occurs, apparently new species.

TRIBELOCEPHALINÆ.

None known.

STENOPODINÆ.

149. *Pygolampis fœda*, Stål.

Pusa. vii-07.

The Fauna records Ceylon, Burma.

150. *Staccia diluta*, Stål.

Pusa. 13-vi-06.

Recorded from Ceylon and Burma.

151. *Oncocephalus annulipes*, Stål.

Pusa. 4-vi-04—24-ix-05—28-vi-05.

Surat. 12-vi-04—7-vii-04.

The Fauna gives Kashmir, Bombay, Bor Ghat, Ceylon, Burma, etc.

152. *Caunus farinator*, Reut.

Pusa. 25-vii-08.

Recorded from Tranquebar.

In this sub-family, our fauna is small, with its origin to the South-east rather than the North-west. It is not complete enough to be satisfactory, and many species may remain to be found.

SALYAVATINÆ.

None found. Only three are recorded in India, two in Sylhet, one in Pondicherry.

ACANTHASPIDINÆ.

153. *Reduvius cincticrus*, Reut.

Pusa. 22-ix-06—26-vi-09.
Recorded from Sylhet.

154. *Acanthaspis coranodes*, Stål.

Pusa. 6-vii-06—17-ii-05.
Daltonganj. viii-05.
Recorded from Sylhet.

155. *Acanthaspis rama*, Dist.

Pusa. 5-iv-05—12-v-06—8-v-07—14-iii-09—viii-08.
Chapra.
Lebong. ix-08.
Recorded in the Fauna from Sikhim and Berhampur.

156. *Acanthaspis rugulosa*, Stål.

Pusa. 17-vii-05.
Chitrakot. iii-08.
Chapra.

In this sub-family, there are many species found in Burma that do not occur in our area. What we have is common to the Gangetic Plain, East, and Burma usually, while we have little in common with the Himalayas. We have few *Acanthaspis* but the abundant species. *Conorhinus* would probably be found, had not Pusa been uninhabited for many years prior to 1904, as it is essentially a household species.

PIRATINÆ.

157. *Phalantus geniculatus*, Stål.

Pusa. 1-vii-06.
Recorded from Burma and China.

158. *Ectomocoris cordiger*, Stål.

Pusa. iii-09—iii-06—16-v-06—10-vii-06.
Bankipur. vii-08.
Burdwan. iii-06.
Chapra.
Recorded from N. Bengal, Bor Ghat, Sylhet, Ceylon, Persian Gulf.

159. *Pirates sanctus*, Fabr.

Chapra (Mackenzie).
Baroma. 6-iii-07.
Recorded from Sind, N. Bengal, Burma, Ceylon.

160. *Pirates quadrinotatus*, Fabr.

Pusa. 27-i-05—7-vii-05—26-vi-07.

Chapra.

Recorded from Sylhet and Ceylon.

161. *Pirates lepturoides*, Wolff.

Pusa. 10-ii-09—10-x-08.

Chapra.

The Fauna records Khandala, Ceylon, Burma, Java, Barnes.

162. *Pirates mundulus*, Stål.

Pusa. 4-vi-07.

Surat. 21-ii-04.

Cuttack. 23-xi-05.

Dacca. 16-i-06.

Chapra (Mackenzie).

The Fauna records Tranquebar, Bor Ghat, Ceylon.

163. *Pirates atromaculatus*, Stål.

Pusa. iii-09—8-ix-08—18-vii-08—x-08—7-iv-07.

Chapra (Mackenzie).

The Fauna gives Assam, Burma, Ceylon, etc.

164. *Sirthenea flavipes*, Stål.

Chapra (Mackenzie).

Khasi Hills. v-05.

The Fauna records Naga Hills, Ceylon, etc.

In this sub-family our fauna is essentially Burmese, and not usually recorded from further North-west.

ECTRICHODIINÆ.

165. *Ectrychotes abbreviatus*, Reut.

Pusa. 6-ix-07—26-iii-05—27-i-05.

The Fauna records Calcutta only.

166. *Ectrychotes dispar*, Reut.

Pusa. 21-ii-05—17-xii-04—27-iv-06—14-iv-08.

The Fauna records Calcutta, Bombay, Bangalore.

167. *Physorhynchus tuberculatus*, Stål.

Pusa. 1-iii-07—3-iv-08.

The Fauna records Assam, Burma, Ceylon. It is with us a rare species, the largest of the Pusa fauna.

APIOMERINÆ.

None recorded.

HARPACTORINÆ.

168. *Harpactor marginatus*, Fabr.

Chapra (Mackenzie).

Katni. ii-07.

The Fauna records North India, Vizagapatam, Ceylon.

169. *Harpactor costalis*, Stål.

Pusa. 7-i-09—iii-09—25-vi-08—8-vii-07.

Lebong. ix-08.

The Fauna records Bengal, Assam, Burma, Malay Peninsula.

170. *Sphedanolestes mendicus*, Stål.

Pusa. 2-viii-07—1-vi-07.

Chapra (Mackenzie).

Mussoorie. viii-07.

The Fauna records Assam, Burma, Malay Peninsula.

171. *Sycanus versicolor*, Dohrn.

Pusa. 12-xi-06.

Recorded from Bengal, Burma, Penang.

172. *Cydnocoris crocatus*, Stål.

Chapra (Mackenzie).

Recorded from Burma.

173. *Coranus spiniscutis*, Reut.

Pusa.—All months.

Purulia. xi-06.

Cawnpur. 15-x-05.

The Fauna records Assam, Ranchi, Bor Ghat and Burma.

This is, in Pusa, very common all the year, predaceous on caterpillars and small insects.

174. *Coranus obscurus*, Kby.

Pusa. iii-09—15-i-05—28-viii-08.

Rasulpur, Bengal. iv-06.

Recorded from Sikhim, Assam, Calcutta, Ceylon and Burma.

I am not certain that *C. fuscipennis*, Reut., is not in our series as I do not regard the descriptions as very distinctive.

175. *Scipinia horrida*, Stål.

Pusa. 11-x-06.

Chapra. 22-x-04.

Recorded from Sikhim, Ceylon, Burma, Philippines.

176. *Irantha consobrina*, Dist.

Pusa. 12-iii-07.

Recorded from the Nilgiris only.

In the Harpactorinæ, our fauna has distinct affinities to that of Assam and Burma, but is very limited; it suggests that only a small number of forms really have passed on from Assam and Eastern Bengal (Gangetic Plain, East) to our area, that we are the extreme north-west limit of some forms and too far out of the moist warm areas for many more.

NABIDINÆ.

177. *Prostemma carduelis*, Dohrn.

Pusa. 17-xii-04.

Recorded from Ceylon and Burma.

178. *Prostemma flavomaculatum*, Leth.

Pusa. 21-xii-04.

Recorded from Burma.

179. *Nabis capsiformis*, Germ.

Pusa. 21-i-09—iii-07—15-vii-06—6-iv-07.

Surat. 15-viii-04.

Simla. x-07.

Recorded from Bombay and Bor Ghat, and Burma. Also the Palæarctic, Nearctic and Ethiopian regions. A very abundant species, which feeds on caterpillars.

The Reduviid Fauna of Pusa and Chapra is small, with many species not recorded which do occur in Eastern Bengal and Assam, and with very few species known also from the Himalayan sub-tropical areas to the north. Until the Reduviid Fauna of the Punjab is known, it is not possible to contrast our fauna, but its affinities, so far as can be seen, are with Eastern Bengal, Assam, Burma and Malaya, far more than with that of Sub-Himalaya or the North-west.

SALDIDÆ.

180. *Valleriola cicindeloides*, Dist.

Pusa. iv-08.

Nagpur. ii-09.

A new species, rare.

CIMICIDÆ.

181. *Cimex rotundatus*, Sign.

This is stated to be the Indian species, found at Pusa as generally in India.

CAPSIDÆ.

MIRINÆ.

182. *Callicratides rama*, Kby.

Chapra (Mackenzie).

Recorded only from Ceylon.

183. *Megaloceræa dohertyi*, Dist.

Pusa.—All months.

Recorded from Tenasserim.

I am not quite certain of this species; it is nearest to *M. dohertyi* of those in the Fauna.

184. *Megacælum stramineum*, Walk.

Pusa.—All months.

Surat.—All months.

Recorded from North Bengal, Kangra Valley, Ceylon. A very abundant insect.

CAPSINÆ.

185. *Pæciloscytus longicornis*, Reut.

Pusa. 20-iv-07.

The Fauna records Calcutta, Ceylon, Nicobar Islands, etc.

186. *Gallobelicus crassicornis*, Dist.

Pusa.—All months.

The Fauna records Bor Ghat and Tenasserim.

187. *Halticus minutus*, Reut.

Pusa. 7-vii-05.

Recorded from Ceylon, Singapur, etc.

The Capsid fauna is very inadequately known, compared with other families, but is a distinct one from that of sub-tropical localities; for instance the very abundant *Deræocoris* of the Himalayas, which are there quite common, are in Pusa wholly absent. Our Capsid fauna is probably distinct, being found on grass and on plants to which each species is more or less definitely confined. The Capsidæ, more than all other Heteroptera, are very insufficiently known all over India.

ANTHOCORIDÆ.

188. *Triphleps tantilus*, Motsch.

Pusa. viii-07.

We have also a not uncommon undescribed species.

PELOGONIDÆ.

189. *Pelagonus marginatus*, Latr.

Pusa.—All months.

The Fauna records India, Burma, S. Africa, etc.

NEPIDÆ.

190. *Laccotrephes ruber*, Linn.

Pusa. 19-viii-05—15-vi-06—24-iv-07.

Chapra.

Igatpuri. 20-vi-04.

Nilgiris. 7,000 feet. v-04.

Akalgarh, Punjab. 30-iii-08.

Recorded from Sind, Kashmir, Assam, Kangra, Bombay, Calcutta, Ceylon, Burma, China, etc.

191. *Laccotrephes maculatus*, Fabr.

Pusa.—All months.

Recorded in the Fauna from Bengal, Assam, Calcutta, Bombay, Ceylon, Burma.

192. *Ranatra elongata*, Fabr.

Pusa. 26-iii-04—viii-08.

The Fauna records Kashmir, Calcutta, Bombay, Nilgiris.

193. *Ranatra filiformis*, Fabr.

Pusa.—All months.

The Fauna records Quetta, Karachi, Behar, Assam, Tranquebar, Bombay, Philippines, etc.

NAUCORIDÆ.

None.

BELOSTOMIDÆ.

194. *Nectocoris stali*, Mayr.

I cannot find we have this, but am not certain.

195. *Sphærodema annulatum*, Fabr.

Pusa. 19-xii-04—19-viii-05—14-v-07.

Burdwan. ii-06.

The Fauna gives only Sind, Sylhet, Calcutta.

196. *Sphærodema rusticum*, Fabr.

Pusa. 25-ix-05—iv-05.

Dacca. xii-08.

Yercaud.

Gauhati. v-07.

The Fauna gives Bombay, Ceylon, Burma, Siam, etc.

197. *Sphærodema molestum*. Duf.

Pusa. 1-vii-07—v-07, etc.

Bangalore.

The Fauna records Kashmir, Calcutta, Malacca.

198. *Belostoma indicum*, Lep. et Serv.

Pusa.—May to September.

Asansol.

Mokameh.

Recorded from Sind, Malabar, Bombay, Trivandrum, Ceylon, Burma, etc.

The Corean *B. deyrollei*, Vuill, of the Brahmaputra, the only other Indian species, does not appear to extend to our area.

NOTONECTIDÆ.

199. *Enithares indica*, Fabr.

Pusa. 17-xii-06.

Surat. 16-vi-04.

Recorded from Tranquebar, Bombay, Trivandrum, Ceylon, Burma, etc.

200. *Anisops sardea*, Herr.-Schäf.

Pusa.—All months.

The Fauna gives Bombay, Burma, etc.

201. *Anisops feberi*, Kirk.

Pusa.—All months.

Kirkaldy says "Distributed over British India," on whose authority is not stated. Distant records Ceylon and Celebes.

202. *Anisops niveus*, Fabr.

Pusa.—All months.

The Fauna records Bombay, Burma, and "suggests" all India.

203. *Plea pallescens*, Dist.

Pusa. x-08—ix-08—vii-09.

Recorded from Calcutta.

CORIXIDÆ.

204. *Corixa hieroglyphica*, Duf.

Pusa.—All months.

Recorded from Assam, N. Bengal, Bombay.

205. *Micronecta striata*, Fabr.

Pusa.—All months.

The Fauna records Calcutta, Kanara, Ceylon.

The aquatic Rhynchota have probably been little collected in India, and one would expect them to be widely spread, since neither heat nor drought would affect them in big rivers such as come down from sub-tropical areas. Still there are puzzles, notably *Belostoma deyrollei* from the Brahmaputra not being found in the Ganges. A feature, too, is the complete absence of *Mononyx*, so common in the hills, and of Naucoridæ. The former is a land insect typical of sub-tropical areas and the Naucoridæ apparently also are not plains' insects at all.

We have now enumerated 205 species of Rhynchota Heteroptera from Tirhut, mainly from one locality, Pusa, in which collecting has been done continuously by many students and others, as well as myself, for five years. We have probably found at least every common species; there may be another 100 rare species not listed, which are not identified or are new. The fauna as a whole is markedly Malayan and Burmese, very markedly distinct from that of the nearest sub-tropical zone, Sub-Himalaya, West. It contains also very few species stretching across the drier north-west, but probably many species common also to the hills of Chota Nagpur and other places to the south-west. How it will compare with the fauna of Central India, East, is uncertain, but we believe

that it shows a greater affinity with the Fauna of the Gangetic Plain, East, though distinct from it. The fauna is not a distinct one, in the sense that it is derived, not originating on the spot; it is derived probably by immigration through Lower Bengal and Eastern Bengal from Burma, and possibly Malaya. Many species which have penetrated into Lower Bengal have not penetrated to this area, possibly on account of the period of intense dry heat which prevails from March 15th to May 15th as a rule. It contains probably a number of species which are now established all over the plains of India, successful species whom heat does not affect or who find in the undiversified vegetation an abundance of the food-plant they require.

If our conclusions are correct, there is justification for considering what are the faunal zones of this continent. We cannot here repeat what is said in *Indian Insect Life*, but we would urge the collection of data upon this point; collectors situated in India can alone provide the data; we want collections made at widespread points by resident collectors; a collection is not a mere agglomeration of specimens, like postage-stamps, but a valuable mass of data from which can be drawn deductions regarding wide subjects such as this; there is scope for many collectors, and until such work is started, this cannot make the progress it should do.

It is perhaps unnecessary to say that we will give any assistance that can be given, and that this subject is being worked at both in the Indian Museum and Pusa. An impetus might possibly be given to collecting, were it realised how valuable are accurately localised collections. We would also point out to systematists and others in Europe that India is not just one level uniform plain and that the accurate record of localities and elevations in the specimens they describe increases the value of their work. Such a locality as "Indes Orientales" is meaningless; North Bengal may be Pusa at 150 feet elevation, Kurseong at 4,700 feet, or Darjiling at 7,000 feet, the three places being tropical, sub-tropical and palæarctic, respectively. If anyone is in doubt as to the elevation, latitude or longitude, or the faunal area of any Indian locality, we will do our best to enlighten him. The accurate record of localities is an extremely important matter, and we hope that such vague terms as "Indes Orientales," "India Orientalis," "Deccan," "Bengal," "South India," will pass completely out of use and give place to greater accuracy.
